of special interest. On the morning of the 4th this station was between a low pressure area to the north and a high to the southward. The surface temperature (−28° C.) began rising about 9 a. m. of the 4th and continued steadily until 4 a. m. of the 5th when it had reached 3° C., an increase of 31° C. in 19 hours. During this period the surface wind changed from southwest to south, again to southwest, then to west and finally northwest. It is noticed that a considerable portion of the rise in temperature occurred after the south component had disappeared, the wind having become westerly and northwesterly some 6 hours before the temperature rise ceased.

A kite flight made at noon of the 4th revealed a moderate southerly surface wind veering with increase in altitude to strong northwesterly at and above 2,000 meters. A pronounced inversion prevailed just above the surface, the temperature increasing from −20.6° C. to −5.9° C. at 370 meters, or −3.98° C. per 100 meters. From the latter altitude to the maximum (2,386 meters above surface) the average lapse rate was only 0.19° C. per 100 meters. The record of the morning of the 5th showed a northwesterly surface wind backing with altitude to westerly at 2,000 meters and above. By this time the surface temperature had risen considerably as previously mentioned but, above what on the day before was the upper limit of the surface inversion (370 meters), the temperatures remained practically the same.

Relatively warm west and northwesterly air currents such as occurred on this occasion are characteristic of this region and are associated with low-pressure areas. The trajectory of this air, instead of being from the cold Arctic regions is evidently from the warm Japanese current of the Pacific."

METEOROLOGICAL SUMMARY FOR SOUTHERN SOUTH AMERICA, DECEMBER, 1927

By J. BUSTOS NAVARRETE
[Observatorio del Salto, Santiago, Chile]

In December, 1927, there was very little activity in the atmospheric circulation. Frequent depressions of stationary character situated off the coast of central Chile brought much cloudiness and morning fog.

Only one depression of true cyclonic type was observed; this storm, which crossed the region of Magallanes on the 1st, caused strong winds, rain and foul weather generally over a large part of the southern area.

The anticyclones which formed over the islands of Juan Fernandez and Chiloe were, however, more numerous; the most important of these appeared on the charts for the following periods: 6th–7th, 8th–9th, 14th–15th, 20th–21st, 25th, and 28th–31st.

Precipitation was relative light in southern Chile and was generally limited to the region between Arauco and Magallanes. At Valdivia the total fall for the month was only 1.81 inches (normal, 4.41 inches).

While along the central coast there was much cloudiness, frequent morning fog and rain, in the interior the weather was uniformly fine. Throughout the first two weeks temperatures were moderate, and a definite change to warmer, with maxima 86° to 90° F., did not come until after the 25th.—*Transl. by W. W. R.*

METEOROLOGICAL SUMMARY FOR BRAZIL, DECEMBER 1927

By FRANCISCO DE SOUZA, Acting Director
[Directoria de Meteorologia, Rio de Janeiro]

The circulation in the lower strata of the atmosphere was abnormally intense; seven anticyclones swept over the Brazilian territory and in addition the depressions over the continent and high latitudes showed the usual activity. The active secondary circulation caused moderate storms on the southern coast.

In all of Brazil rainfall was generally light, especially in the higher latitudes, where the monthly total averaged 2.25 inches below normal.

Over the greater part of central and southern Brazil coffee, cotton, sugar cane, cereals, and vegetables suffered from lack of sufficient rain.

Fine weather prevailed in Rio de Janeiro; the duration of sunshine was 66.5 hours in excess of the normal for the month and the total precipitation showed a deficiency of 3 inches. The maximum temperature was 96° F. There were two storms; during the heavier one on the 15th the wind reached a velocity of 42 miles per hour from the south-southwest.—*Transl. by W. W. R.*

NOTES AND ABSTRACTS

A PROTOTYPE OF THE PUBLICATION "WORLD WEATHER RECORDS" [1]

The editor, in common with many others, welcomed the appearance of the volume here considered, but the welcome was somewhat dimmed by the discovery that the record for practically all of the meteorological stations comprising the great network maintained by Russia during the period antedating the World War began with the year 1881, whereas the observations began 10 to 12 years earlier. The omission of the early records seems not to have been due to the committee that collected the original data.

While in the Weather Bureau library a short time since, the attention of the editor was called to the second volume of the 1878 Yearbook of the Royal Meteorological Institute of The Netherlands, published in 1886 and prepared by a no less competent person than the late H. Wild, who for many years was director of the Central Physical Observatory at St. Petersburg (now Leningrad). This publication contains the monthly mean pressures and temperatures for practically all stations on the globe, wherever situated, that were in operation in the late seventies. The record begins with January, 1871, and concludes with December, 1882, thus bridging the gap that exists in the publication, "World Weather Records," above mentioned. The monthly means of pressure, however, do not form a homogeneous series with those given in the last named publication.—*A. J. H.*

[1] Smithsonian Misc. Coll., vol. 79, World Weather Records, collected by a committee, assembled and published by H. Helm Clayton, 1927.

RADIO BROADCASTS OF TWICE-DAILY WEATHER REPORTS

For several months past the U. S. Weather Bureau, with the cooperation of the Navy Department, has broadcast the morning weather reports from more than 200 station in the United States and Canada. Beginning on February 1, 1928, the complete reports both morning and evening will be broadcast at 8:15 a. m. and 8:15 p. m. eastern standard time in cooperation with the

Office of Communications of the Navy Department by distant control connection with the naval radio station (NAA) at Arlington, Va.

The reports are expressed in the regular Weather Bureau Code, which may be translated at sight after a very short study of the key to the system. These broadcasts afford the means of the widest possible distribution of the twice-daily weather reports from all parts of the country for the use of both the Army and the Navy, commercial and Government aviation fields, business organizations and individuals who may have need of the information at an earlier hour than has been possible to release it.

Two other broadcasts are made at 11 a. m. and 11 p. m. for the benefit of European weather services. The weather reports in these broadcasts are expressed in the International Numeral Code. Information relative to that code may be obtained on application to the Weather Bureau at Washington, D. C.

FREE-AIR CONDITIONS IN NORTHEAST OKLAHOMA FAVORABLE TO LOCAL PRECIPITATION

J. A. RILEY

The official in charge of the Weather Bureau kite station at Broken Arrow, Okla., writes as follows regarding the free-air conditions favorable to the occurrence of precipitation at his station:

I visualize the conditions under which precipitation occurs in this region under pressure distributions of this kind as a ridge of air which takes the place of a mountain range over which the winds are blowing, with precipitation on the windward side. A number of times when such a condition occurred we could not get a kite up or it was unsafe. We felt sure that a south wind was blowing at some distance aloft, and we arrived at this conclusion by the sound of some machinery which runs night and day south and southeast of the station. This can hardly be heard when north winds prevail at all altitudes. But if there is a south wind anywhere within the first kilometer, the sound is plainly audible. On November 9, 1927, we made a flight in such a condition. Shortly after the head kite was launched in a northeast wind the surface wind practically died out, and the light fog became denser throughout the flight and was dense at the end. The kites veered through east and south into a southwest wind at the highest point reached. It had been raining for some time before the flight with a moderate shower from 7:08 a. m. to 7:18 a. m. The weather map shows a slight bulge of the HIGH just north of us on that morning, and rain all over the southern side of the HIGH in the Eastern States. We have no upper air data here except our own but I am of the opinion that these rains were caused by southerly winds rising and flowing across the HIGH.—*J. A. Riley.*

While it was impossible to obtain pilot-balloon observations over the region near to Oklahoma because of rain and low clouds, the kite flight at Due West, S. C., revealed a somewhat similar structure in the free air above that place from which it may be inferred that there was a very sharp shift in the wind aloft on the boundary between relatively cold lower airlayers and a southerly current above.—*Welby R. Stevens.*

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THE WIDESPREAD MENACE OF HAIL[1]

By S. D. FLORA

The year 1927 was characterized by six days, each having very severe hailstorms in Oklahoma, Kansas, eastern Colorado, and Texas. The total crop loss from these storms aggregated from five to seven millions. The exact total due to hail alone can not be determined since it is impossible to segregate losses due to hail and high winds combined. The days with severe hailstorms were May 4–5 and June 1–4, 1927.

The total estimated loss in 1927 from 298 storms was in excess of $15,000,000. In 1926 there were 295 storms and a total loss of $12,000,000. In 1925 the number of storms was only 225.

In the States of Oklahoma, Kansas, Colorado, Texas, Iowa, Illinois, and Nebraska single storms wrought a damage in excess of a million dollars and an outstanding storm in Kansas on June 2 caused estimated loss of two millions because of the destruction of 30 square miles of promising wheat about ready for the harvest.

Reference is made to notable storms throughout the United States in recent years.

CHINOOK EFFECTS IN ALBERTA, JANUARY 4, 1928

Mr. A. Griffin, of Brooks, Alberta, submits the following:

Jan. 4, 1928, 3 p. m. It may be worth reporting that it rained 0.03 inch this morning between 9:30 and 11 a. m. The raindrops were small but did not freeze until they reached the ground. Temperatures recorded to-day are as follows:

	°F.		°F.
9:00 a. m.	11	1:30 p. m.	24
11:30 a. m.	17	3:00 p. m.	32
12:30 p. m.	24	3:30 p. m.	36

Light chinook blowing by 3 p. m., eaves dripping and snow softening perceptibly. The temperatures for preceding days are as follows:

	°F.	°F.
Jan. 1, 1928,	max. −24,	min. −38.
Jan. 2, 1928,	max. −11,	min. −33.
Jan. 3, 1928,	max. 14,	min. −26.
Jan. 4, 1928,	max. 32,	min. −10.

At 3 p. m. barometer falling slightly from 26.63 inches at 9 a. m. Cloudy up to about noon, low clouds. Cleared up shortly after noon.

Mean of maximum and minimum temperatures for December, 1927, was −2.7° F. and average for the 12 preceding Decembers is 17.9° F.

The weather chart for January 4, 8 a. m., seventy-fifth meridian time, shows a rather large area of higher temperatures in the last 24 hours stretching from Alberta south to Helena, Mont., the eastern edge of which had not yet reached Brooks Station.—*A. J. H.*

[1] Abstract.